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TITLE:

METHOD AND APPARATUS FOR
PROCESSING AN INTERNATIONAL
PASSENGER

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METHOD AND APPARATUS FOR PROCESSING AN INTERNATIONAL PASSENGER

BACKGROUND OF THE INVENTION

5 This invention pertains to the field of air travel transportation and in particular the field of processing passengers through customs and immigration services of a destination country. It also concerns the automatic acquisition and processing of data concerning the passengers.

10 Air travel of passengers between countries has expanded significantly over the past 30 years. An ever-increasing number of passengers are taking advantage of the convenience and speed of air travel for a variety of reasons. These reasons include business travel, leading to the growth in international trade and increasing interdependence of the economies of many countries participating in trade. The reasons for the expansion of air travel also include pleasure travel, leading to growth in tourism and hospitality industries around the globe.

15 Large jet aircraft enplane and deplane hundreds of passengers on every flight from an out-bound nation (point of embarkation) to an in-bound nation (destination). These passengers include businessmen and businesswomen anxious to retrieve their luggage and proceed to their destinations. These
20 passengers include tourists who must clear customs and immigration prior to proceeding. A problem may arise in that it can take a significant amount of time to clear so many passengers through customs inspections considered necessary by almost every sovereign nation. It is in the interest of the destination country to control the flow of both goods and people to their country. A customs and
25 immigration inspection is the normal way to accomplish this control. It is also in the interest of customs and immigration officials to accomplish these inspections quickly. This may give passengers an impression of efficiency and competence

on the part of the government of the destination country, allowing the passengers to proceed without unnecessary delay. A pleasant experience may also encourage passengers to return for subsequent trips.

What is needed is a way to quickly clear passengers from an aircraft through customs and immigration, so that the actual time spent in these processes is kept to a minimum. What is also needed is a method and a system to quickly clear passengers and their baggage through customs and immigration.

BRIEF SUMMARY

The invention is a method and an apparatus to ease the processes of customs and immigration for international passengers. One embodiment is a method for processing an international passenger through customs and immigration requirements of a sovereign nation. A passenger scheduled for an international flight approaches a check-in counter and enters information identifying the passenger into a computer or computer interface linked to a computer network. The information scanned into the computer or computer interface may include a passport photograph or may contain other biometric information uniquely identifying the passenger. In one embodiment, an electronic video or still camera at the check in counter records an image of the passenger. The electronic image is compared with a prior image of the passenger. A boarding pass is issued to passengers whose images match and who are scheduled for the flight. A second video or still camera may be used to record another electronic image of the passenger en route to the aircraft to ensure that the passenger boarding the aircraft is the person who checked in.

Information gathered at the check-in counter is then forwarded to officials in the government of the flight destination country. The officials may compare data from passports and from images recorded at the check-in counter to databases of individuals in which the government has an interest. The

government may then instruct the airline as to which passengers should proceed to customs or to immigration, or to both.

Upon arrival at the destination country, the passengers deplane and proceed to an Immigration booth. The passenger enters information identifying the passenger into a computer interface at the Immigration booth, and another video or still camera may be used to record another electronic image of the passenger. The electronic image may be compared to a prior image of the passenger. Other biometric data may be used instead of a photographic image. Once the identity of the passenger is confirmed, the passenger is routed in accordance with instructions from the government. If there is no requirement to be screened at Customs or Immigration, the passenger and the passenger's baggage may be routed automatically for pickup at a domestic baggage carousel or to connecting flights.

Further aspects of the invention will be apparent from the drawings and description of the preferred embodiments detailed below.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

Fig. 1 is an overview of the process.

Fig. 2 is a flow chart for a portion of the process in an out-bound country.

Fig. 3 is a flow chart for a portion of the process in an in-bound country.

Fig. 4 is a block diagram of an apparatus for passenger check-in.

Fig. 5 is a block diagram of an immigration counter.

Figs. 6-8 are flow charts for processes of routing information, passengers, and baggage.

Fig. 9 is an overview of another embodiment of the process.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Fig. 1 is an overview of a process for moving an international passenger from an out-bound or originating country 110 to a destination country 120. In one embodiment, these countries may be France and the United States. The process includes transport of the passenger 130, baggage of the passenger 140, and information 150 concerning the passenger and baggage. The passenger and the baggage travel on an aircraft 160. The information may travel through another medium, such as radio or telecommunications between computers.

Facilitating passengers through customs and immigration thus involves breaking the process into at least three separate flows: a flow of information from the passengers and the airline to the customs and immigration officials of the in-bound country; a flow of passengers from the out-bound country to the airline flying the passengers and then to an aircraft and to an Immigration point in the in-bound country; and a flow of baggage from the passengers, through at least one inspection station, and then to the in-bound country.

Separating the passengers and baggage in which the government of the destination country shows an interest from all other passengers and baggage may speed up the process. The separation process is made possible by automatically acquiring information concerning the passengers and the baggage and promptly forwarding the information to the government of the destination country. While the aircraft is enroute, the government, typically customs and immigration officials may study the information and decide which passengers and which baggage require personal attention. The officials then communicate this information to the airline. The airline routes the passengers to immigration or customs or to their final destination. The airline also routes the baggage either to customs, to a baggage claim area, or to a further destination for the passenger. Because only about 5% of passengers and baggage are typically of

interest to customs or immigration officials, most passengers and their baggage (95%) are processed in an expedited manner, thereby completely bypassing a physical trip to Customs or to Immigration.

Fig. 2 is a flowchart for a portion of the process that occurs in the country from which passengers are flying, that is, the out-bound country. An airline that flies scheduled routes will desirably have flight data for the present day's flight entered 100 and segregated into a memory of a computer or computer interface at a check-in counter. The computer interface is linked to a computer network, either local or global, of the airline. The airline will also retrieve data on passengers with reservations for a particular flight 210. A passenger approaches the airline check-in counter and enters information 220 concerning his or her identity into a computer interface at the check-in counter. The passenger may be required to know a password or personal identification number (PIN) to access the computer. The information entered may be indicative of the passenger's identity, e.g., a passport number, driver's license number, or a bar code indicative of the passenger's identity. In some embodiments, a passport may not be required for travel between nations. Treaties or other agreements between nations may require other information that is sufficient to identify the passenger, such as a driver's license or other personal identification. The information scanned or entered into the computer interface may include an image from the passport or other personal identification.

The computer interface at the check-in counter will check information on the particular passenger and compare the information with the data on passengers with reservations for the particular flight 230. In one embodiment, a security interview may also be conducted manually by airline personnel or automatically by the passenger responding to questions from the computer or computer interface. If the data match, and the passenger has a reservation, a first electronic photo of the passenger may be recorded 240 into a computer-

accessible memory. The photo may be compared and matched 250 with the image taken from the passport or driver's license, or other known prior or officially approved image of the passenger. If the data match, the computer may then present the passenger with an electronic customs form, such as a Customs Declaration Form. The passenger then fills out the form 260 and enters the data into the computer interface 270. Instead of using an electronic camera, an actual photographic image of a passenger may be taken and scanned into the computer memory. It is not strictly necessary that a camera, such as a video or still camera be used. Any technique using biometric data that uniquely identifies a person may be used, including but not limited to, a fingerprint, a palm print, an iris scan, or a voiceprint, or a combination thereof. This information may also be saved or forwarded, or both, as required.

The passenger's baggage is removed from the passenger's control 275 by surrendering the baggage for inspection. The passenger's baggage then may be inspected by hand or by electronic techniques 280. The electronic techniques may include x-ray or other visual techniques, and may also include an Explosive Detection System (EDS), or other electronic or chemical inspection techniques. An important point of baggage inspection is that an electronic record, such as an x-ray or EDS scan, may be made and saved 285. The baggage inspection record, along with passenger information and the completed customs forms are forwarded 290 to officials of a government or agents of the government, in the destination country. The officials may then review the information. The officials may inspect, review, and compare the information concerning the passengers, the baggage, and customs declarations. The officials may then decide which passengers should receive personal processing by customs or immigration in the in-bound country. The officials forward this information to the airline for use upon deplaning. In one embodiment, the government may require that the airline receive and relay an instruction to every passenger to proceed through

Customs and Immigration, or that the passenger can proceed without further inspection. In other embodiments, the government may require that only passengers selected for customs or immigration (or both) be specifically notified. In another embodiment, the government may require that all passengers not selected receive a pass or clearance to proceed without further processing. All embodiments are meant to be covered by the present invention.

Fig. 3 depicts the process once the passengers begin to enplane. A video or still electronic camera may record one more electronic photo 300 of a passenger and compare this photo to the first electronic photo or to the passport or driver's license photo 310 to ensure that the passengers enplaning are the same passengers that checked in. Upon arrival in the inbound or destination country, the passengers deplane 320 and proceed to an immigration booth 330. In one embodiment, the Immigration booth is similar to the check-in counter in the outbound country. The passengers once again enter into a computer interface at the Immigration booth information indicative of their identity 340, such as a PIN and then a passport number, passport barcode, or driver's license number. A video or still electronic camera may record another photo of the passenger at the Immigration counter 350. The data is sufficient to verify each passenger's identity 360.

The airline has now received from the government in the in-bound country information on which passengers must proceed to customs or immigration or both 370. Upon verifying each passenger's identity, a computer or computer interface at the Immigration outputs instructions to each passenger to proceed to customs or to Immigration or to neither. In one embodiment, a printer prints a ticket for each passenger with the instructions 375. In another embodiment, the instructions to passengers not selected to proceed to customs or to immigration are printed on a green background or with green ink; passengers selected to proceed to Customs or to Immigration are printed on a red background or with red ink.

Baggage from passengers selected is routed automatically from the airline to the customs carousel 380. Baggage from passengers not selected and who have connecting flights is routed to the connecting flight 385; baggage from passengers not selected and who do not have connecting flights is routed to a baggage claim area 390, such as a baggage claim carousel.

Fig. 4 is a diagram of apparatus useful in processing passengers, baggage, and information concerning passengers and baggage. In the out-bound country, preferably at the point of embarkation, an airline check-in counter 400 has a computer or computer interface 402, with access to a first memory 304 containing a database of information on the airline's customers. The database may reside locally or may be at a remote location, such as a main database storage facility for the airline in another country. Interface 402 has at least one memory 406 in addition to the first memory 404. Also linked to computer 402 is at least one scanner 408, 410.

The scanner 408 may be of a type to scan information from a flat document, such as a page of a passport or a driver's license or other identity card. The scanner 410 may also be of the "swipe" variety, suitable for reading a memory on a card or card-like device, or the scanner could be suitable for reading a barcode, such as a standard infrared barcode reader. Any magnetic or electronic device suitable for receiving information concerning the identity of the passenger is meant to be included. A camera 412 may also be available for recording an electronic image of the passenger. A microphone 414 may also be used to enter a voice sample from the passenger. Other biometric data may use other types of entry devices. The electronic image of the passenger may be processed by software residing on a computer accessible to airline personnel and saved after processing; or the image may be simply recorded. Software may be voice-recognition software, facial recognition software, or if fingerprints, palm prints, or iris scans are used, feature recognition software.

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5 The passenger's baggage is also processed at the out-bound country. The processing may be accomplished by airline personnel or by third-party personnel after the passenger has surrendered control of the baggage. A baggage inspection system 416 is used to inspect and save a record of each passenger's baggage. The baggage may utilize x-rays or other penetrating media to render a visual record of the inspection. A user uses a computer or computer interface 418 to control the inspection system 416 and save a record of each passenger's baggage on a computer memory 420. The data should be transferable to another computer and computer memory, such as airline computer 402 and memory 406. The goal of inspecting and saving is to transfer the inspection record to officials of the in-bound country for their review. The computerized information may be transmitted to the government of the destination country via the Internet 424 or by any other convenient method. In addition to visual-type records, other inspections or additional baggage inspections may be made, such as by systems meant for scanning by an Explosive Detection System (EDS) or other electronic or chemical inspection. Records of the inspections are kept and forwarded to officials of the in-bound country.

20 A passenger who has completed the check in process may proceed to boarding the aircraft. In one embodiment, a camera 430 may record another image of the passenger as he or she enplanes, to ensure that the passenger who checked in is the passenger who boards the aircraft. This image may be compared with passport data, passenger data, or an image previously recorded, and the image may also be stored for later retrieval or referral. The inspection

25 may be accomplished manually by airline personnel or by a computerized process. As mentioned above, it is not strictly necessary that a camera, such as a video or still camera be used. Any technique that uniquely identifies a person may be used, including but not limited to, a fingerprint, a palm print, an iris scan,

or a voiceprint. This information may also be saved or forwarded, or both, as required.

Once the passenger has completed check in and boarding, all or some of the information from the passenger identification and the baggage inspection may be forwarded to appropriate government officials in the in-bound country. The use of the information is not limited to customs and immigration officials. It may be desirable, or required, for the airline or for others to whom the information is provided, to share the information with the Federal Inspection Service or an agency that deals with criminal law enforcement. These agencies include, but are not limited to, a national or federal police force, a federal inspection service, a federal aviation administration, an agriculture department, a civil aviation authority, public health administration officials, fish, game and wildlife officials, or other governmental authority with interest in incoming passengers and goods. The government then informs the airline of which passengers and which baggage the government wishes to inspect personally. The airline then makes this information available at its Immigration booth in the in-bound (destination) country. The airline also uses this information to route baggage of the passenger to a customs carousel, to a connecting flight, to a baggage claim area, or to another destination as desired.

Once the aircraft has completed its trip, the passengers deplane and proceed to an Immigration booth. Fig. 5 depicts an apparatus suitable for processing passengers and baggage at this stage. The Immigration booth 500 has at least one interface 502 having access to at least one database 504 and also having at least one memory 506. The interface 502 may also be linked to at least one scanner 508, 510 for entering information from each passenger. The scanner may be used to scan in information to uniquely identify each passenger, such as a page from a passport, a passport number, or a barcode used to identify the passenger. The Immigration booth may also be equipped with a camera 512, preferably an electronic video or still camera. Instead of using an

electronic camera, an actual photographic image of a passenger may be taken and scanned into the computer memory. A microphone 514 or other biometric data entry device may be used to record a voice sample or other biometric data of the passenger.

5 The airline may then use these images and databases to verify the identity of each passenger. During the flight, the government of the in-bound country has reviewed the information forwarded by the airline. The government then forwards instructions to the airlines on which passengers and baggage must process through customs or immigration. The government may forward these
10 instructions to the airline via the Internet 518 or other communications media. The passenger may receive routing instructions 516, such as a ticket or card that may be printed at the interface, instructing the passenger to proceed to customs or to immigration, or that the passenger is free to proceed as he or she wishes. In one embodiment, the ticket or card may be printed on green paper or with green ink if the passenger is free to proceed, while the ticket or card may be
15 printed on red paper or with red ink if the passenger should proceed to customs or to immigration.

 In another embodiment, an international passenger is processed from a first country to a second country by dividing the processing into three flows. Information concerning the passenger and the baggage is one flow, the
20 passenger is processed in a second flow, and the baggage of the passenger is processed in a third flow.

 One method of processing an international traveler splits the process into three parts. In Fig. 6, a passenger schedules international travel 600 with an
25 airline or transport agent. Information concerning the passenger and the flight date are entered into a computer interface and may be transferred 602 to a different computer or a different memory location as the travel date nears. The processing is then split into three parts 604, for the passenger 606, the baggage

of the passenger 616, and information 626 concerning the passenger and baggage.

Fig. 6 depicts the routing for the baggage of the passenger. The baggage of the passenger is inspected 626 by an electronic method, such as a visual x-ray image, and at least one record is made of the inspection. The baggage may also be inspected by other methods, such as an Explosive Detection System (EDS), and a record made of that inspection. An image or record of the inspection or inspections is saved 628 and may be sent to the government or agent of the government of the destination country 630, where images or records are reviewed or inspected. The airline or travel medium then receives instructions 632 from the government as to whether or not the government has an interest in the passenger or the baggage. The baggage is then routed 634 to either a customs carousel, or to a connecting flight for the passenger, or to a baggage claim area.

Fig. 7 depicts a process for automatically gathering information concerning the passenger and his or her baggage 716. Data concerning the identity of the passenger is gathered automatically 718, such as by retrieving personal information from a computer record, or by entering information via scanning a passport, an identity card, or a computer with stored information concerning the identity of the passenger. A first image of the passenger may also be scanned 720 from an electronic video or still camera, the first image used for comparison with a passport photo or known prior image stored in a computer, to verify the identity of the passenger. The first image may be stored in a computer memory 722. As noted above, biometric data other than a photo may be used.

Other information is also gathered automatically, when the passenger enters information into an electronic customs form 724 on a computer interface and stores the information on a computer or computer memory. Information from a baggage inspection record is also gathered automatically 726, and stored

in a computer. When the passenger boards an aircraft or other international mass travel medium, such as a ship or a bus, his or her identity may be verified by another electronic image 728 recorded by another electronic camera. This image may be stored on a computer. The information gathered automatically concerning the passenger is sent to a government 730 or governmental agent in the destination country. This information may include the passenger's identity, the customs declaration, the passenger's electronic image, an inspection image or result from a baggage inspection, and any other information required by the government of the destination country. The government then sends instructions 732 to the airline or travel company concerning any passengers in whom the government has an interest or passengers the government wishes to proceed to customs or immigration.

While the information is being processed, the international passenger is also being processed according to the flowchart depicted in Fig. 8. The passenger checks in with the airline with which he or she has scheduled travel 806. After providing information concerning his identity, his image, and the customs form, the passenger may board the aircraft 808 or mass travel medium and proceed to the destination country 810. The passenger deplanes the aircraft or travel medium 812 and proceeds to an Immigration booth 814. At the Immigration booth, the airline or transport company provides the passenger with instructions, according to whether the government of the destination country has an interest in the passenger, or the baggage, or neither. The passenger then proceeds to customs, to immigration, or to a destination of his or her own choice 816. The process may also be used without all the desirably automated features discussed above, such as embodiments using some of the automated features, in conjunction with equipment currently available and in use at many airports.

Fig. 9 discloses another way to practice the invention. Rather than filling out a customs form manually, or at a computer interface at the check in counter, the aircraft may have a computer interface to customs officials in the in-bound

country. In one embodiment, for travel from an out-bound country 900 to an in-bound country 910, passengers on an aircraft 920 may fill out customs forms at an on-board computer interface. The data may then be transmitted 930 to officials in the in-bound country. After review, the officials may then notify 940 passengers on the aircraft as to who should proceed to customs upon landing.

While this invention has been shown and described in connection with the preferred embodiments, it is apparent that certain changes and modifications, in addition to those mentioned above, may be made from the basic features of this invention. For example, passports are normally required for passengers traveling from one country to another. However, the growth of international travel and the proximity of some countries may lead to treaties in which passports are not required for nationals of reciprocating countries. In these instances, other identification may suffice. The alternate identification may be a driver's license or personal identification card issued by a nation or a political subdivision of the nation, such as a state of the United States or a province of Canada. The invention is meant to include the use of any identification technique acceptable to the in-bound country. Thus, a scan of a unique identifier of a person may be used in lieu of an image scan or a photograph. These unique identifiers include, but are not limited to, a fingerprint, a palm print, an iris scan, and a voiceprint.

The discussion above has mentioned x-ray and EDS inspection of baggage. The invention is not limited to such devices or techniques, and is meant to include any inspection technique that may be accomplished automatically and may produce an electronic record. Thus, any penetrating radiation, such as x-rays, may be used. Magnetic devices, or electro-magnetic devices, such as magnetic resonance imaging (MRI) devices may be used. It is conceivable that other non-destructive inspection techniques may be used, such as ultrasonic techniques (contact or non-contact), eddy-current devices, or other electromagnetic techniques. The invention is meant to encompass all of these and other techniques. Virtually any technique may be used so long as it

produces a recordable and electronic record that the airline or inspection personnel may review and send to the government of the destination country.

There are many ways to practice this invention. As an example, the discussion above has focused on aircraft travel, because of its popularity and convenience for long distance travel. The method may be used for shorter travel excursions between countries, such as when a bus is used for travel. The method may also be used for ocean travel on ships accommodating a large number of passengers, in which the ocean liner and the passengers will benefit from speedy processing of large numbers of travelers. Accordingly, it is the intention of the applicants to protect all variations and modifications within the valid scope of the present invention. It is intended that the invention be defined by the following claims, including all equivalents.